largely ineffective in reducing the rat population. Institution of a vigorous poisoning and trapping program on Midway Atoll is needed to prevent the extermination of the Bonin Petrel as a successful breeding species there.

Summary.—One Bonin Petrel colony was free of rat predation while others suffered nearly total predation. The continuous incubation, orientation of the incubating petrel with respect to the tunnel entrance, procellariiform odor, and learning are discussed in relation to rat predation. If the present rate of egg predation persists, the Bonin Petrel will soon be lost as a successful breeding species on Midway Atoll.

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On the Slit Pupil of the Black Skimmer (*Rynchops niger*).—The Black Skimmer is the only bird known to close the pupil into the form of a vertical slit. The slit pupil was first noted by Taczanowski (Proc. Zool. Soc. Lond., 1874:563) and was later discussed by Wetmore (Proc. Biol. Soc. Wash. 32:195, 1919) as follows: "The opening was reduced very little in its vertical length but narrowed greatly so that when contracted the opening was nearly as high as when expanded. When fully opened the upper and lower points of the pupillar aperture were marked by distinct angles so that even at this time the opening was not circular."

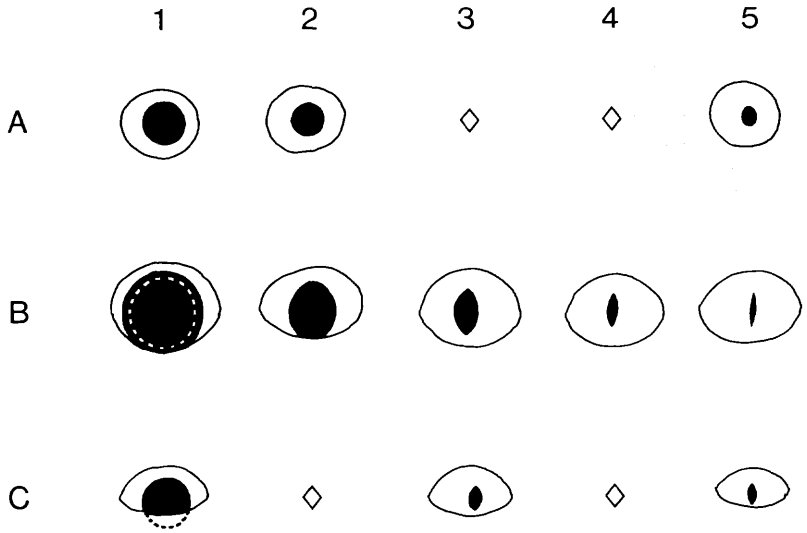

FIGURE 1. Eye openings and pupils (black) of the Black Skimmer and Common Tern under different light intensities. A, Common Tern (adult); B, Black Skimmer (adult female); C, Black Skimmer (juvenile). Incident light readings in lux: (1) 0, (2) 530, (3) 8250, (4) 93,500, (5) 140,800. Each row represents a single individual. Photographs taken at same distance from each subject. The view is not directly into the pupil but slightly to one side. Diamonds represent missing data.

Walls (The Vertebrate Eye and its Adaptive Radiation, Cranbrook Inst. Sci. Bull. 19:219, 1942) pointed out that a slit pupil *per se* is not an adaptation for improved vision in dim light, although it occurs primarily in nocturnal or aquatic vertebrates. Its value is rather in achieving a greater reduction of the pupil in those nocturnal animals that must protect the iris in bright sunlight. The pupil of a cat is closed by 2 vertical bands of muscle that cross each other above and below the pupil, as well as by a sphincter. This arrangement allows a greater reduction in pupil size than is possible with a sphincter alone. Greater reduction would be especially important if the maximum pupillary opening were relatively large as an adaptation for night vision. For the Black Skimmer it has neither been demonstrated that the maximum pupillary opening is greater with respect to the diameter of the eye than it is in related species, nor that the slit pupil effects a greater reduction in area than is achieved by a circular pupil. To answer these questions, we photographed the eyes of live Black Skimmers and a Common Tern (*Sterna hirundo*) under different light conditions. We captured birds in mist nets on Assateague Island, Maryland (July 1965) and held them for 6 h to obtain a series of photographs of each individual. Photographs were taken with a Startek flash camera and intensities of light were measured with a light meter. The brightest light was measured under clear sky with the bird's pupil facing the sun, and the darkest was at night with no moon. We obtained data on one adult and one juvenile skimmer and an adult tern. In addition we measured the length, height, and depth of the eyeball and the internal diameter of the sclerotic ring of spirit specimens of a female Black Skimmer and a Common Tern in the Smithsonian Institution.

Eye and pupillary openings drawn from projected transparencies are illustrated in Fig. 1. Light intensities for each column are the same and they increase from left to right. The series for adult tern and juvenile skimmer are incomplete because the pupil in some photographs was not clear enough to permit an accurate drawing. Note that the juvenile

skimmer (nearly fledged) had not yet fully developed the capacity to produce a slit pupil. Wetmore's description of a "fully opened" pupil, cited above, applies to low light conditions (col. 2) but not to almost complete darkness (col. 1). Reduction in the height of the closed pupil to about half its height when fully opened suggests that a sphincter is part of the iris musculature in the skimmer.

Measurements of the maximum and minimum pupillary openings based on the drawings in Fig. 1 show that the closed pupil of the adult skimmer is only 5% of the area of the fully opened pupil, whereas that of the tern is about 20%, and of the juvenile skimmer about 10%. There was some variation in pupillary opening of the same individual in consecutive photographs as indicated by the dotted and solid outlines in B1. The smaller opening is not a residual reaction to a previous flash because the pupil was largest in the second of 3 flash pictures of the same eye taken at about one minute intervals at night. In the adult skimmer, the area of the closed pupil is about 10% of the area of the smaller opening in B1. We are not certain that the pupils of the tern and juvenile skimmer were fully opened in our single pictures in column 1, but our measurements of sclerotic ring openings (57% of eye diameter in an adult skimmer, and 46% in a tern) suggest that the adult skimmer has a pupil that is relatively larger than that of a tern. It is interesting that the external dimensions of the eyeball of the female skimmer were slightly less than those of the much smaller tern.

In answer to the questions posed above, we found that (1) the Black Skimmer has a relatively larger maximum pupil size than that of a Common Tern, and (2) the adult skimmer effects a greater reduction in its pupillary area from darkness to bright light than does the tern. These features of the adult skimmer's eye may serve to enhance nocturnal vision in support of the bird's habit of feeding during even the darkest nights, and to protect the retina during daylight feeding and other activities in brilliant light. The relatively small eye of the skimmer may relate to its essentially tactile foraging method in which, unlike the tern, the skimmer rarely uses its eyes to locate individual prey.—RICHARD L. ZUSI AND DAVID BRIDGE, *National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.* Received 8 Dec. 1980; accepted 21 July 1981.

Record of Movement of a Laughing Gull to Hawaii from New Jersey.—The Laughing Gull (*Larus atricilla*) has rarely been observed as an accidental migrant in the Hawaiian Islands. King (Seabirds of the Tropical Pacific Ocean, Smithsonian Institution, Washington, D.C., 1967) reported the species at sea, south of the Hawaiian Islands. Berger (Hawaiian Birdlife, Univ. Hawaii Press, Honolulu, 1972) recorded the collection of a specimen on Oahu by Eugene Kridler on 26 July 1968. During 1979 and 1980 however, several probable Laughing Gull sightings were made by various observers in Hawaii. One sighting of an immature bird, possibly a Laughing Gull or a Franklin's Gull (*Larus pipixcan*) was reported on the Puu O Kali, Maui 1979 Christmas Bird Count by Kepler and Kepler (Elepaio 40(10):139–141, 1980).

On 14 December 1979, an immature Laughing Gull was turned in by an unknown individual at a bird salvage station set up by the Hawaii Division of Forestry and Wildlife at Lihue, Kauai. The salvage station, one of 9 set up around the Island, serves as a collection point for hundreds of Newell's Shearwaters (*Puffinus puffinus newelli*) that injure themselves by flying into utility wires at night on Kauai's brightly lit highways and urban areas. Citizens cooperate annually by picking up fallen birds and turning them in at salvage stations. Several other injured bird species are turned in incidentally along with the shearwaters. The cooperating public reports the date and location of each bird picked up. The Laughing Gull turned in on 14 December 1979 was originally found near Ahukini, Kauai. It was emaciated and died shortly after being brought to the salvage station.

Of interest was the fact that the Laughing Gull was banded (USFWS 815-58831). Since it was an immature bird, there was a question as to whether it was a Laughing Gull or a Franklin's Gull. A band recovery report was submitted to the Bird Banding Laboratory and it was learned that the gull was *L. atricilla.* It was banded as a flightless juvenile on 19 July 1979 near Barnegat Light, New Jersey, by Joanna Burger and Shisler.

The Laughing Gull reported here was not only remarkable because of the abnormal east to west movement (approximately 8000 km), but also because the movement took